■ JAPAN'S GLOBAL PUSH • HOW SAFE ARE THE AIRLINES? • RALPH NADER RETURNS ■

FORTUNE

"KILLER" COMPETITORS

MAY 22, 1989

FORTUNE

"We are very confrontational. The minute you back off, a little of the intensity drops."

COVER STORY / PAGE 36

ABOVE: Gerd Ludwig photographed Emerson Electric CEO Charles F. "Chuck" Knight with workers at a motor plant in Paragould, Arkansas.

COVER: Knight photographed by Ludwig at Emerson headquarters in St. Louis.

MANAGING/Cover Story

COMPANIES THAT COMPETE BEST 36

These outfits aren't just winners. They're aggressive machines, laying waste to the competition every day, amassing impressive market share, then amassing more. Some bear familiar names: Eastman Kodak, Perrier, Emerson Electric. Others you may have heard of only if you've had the bad fortune to try to sell against them: Unifi, Jostens, AMP. Here's how they keep rolling relentlessly on. *by Bill Saporito*

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The nation's huge investments around the world are becoming almost commonplace—a major company here, a giant factory there. But now the Japanese are going further: donating to charities, striving to be good corporate citizens, sending more aid to the Third World than any other country (the U.S. is No. 2). Will political power follow all that cash? *by Carla Rapoport*

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The patrician Treasury Secretary could greatly affect business, investors, and taxpayers. Results so far: two dramatic initiatives—but some jaw-dropping gaffes as well. *by Louis S. Richman*

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Terrorists and an aging fleet of aircraft threaten the industry's impressive safety record. Maintaining safety in the air and security on the ground will get costly. *by Anthony Ramirez*

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Beyond the star performers, many U.S. companies and industries still do not produce well enough. A new MIT report, exclusively excerpted here, tells why—and what America must do.

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"There is no such thing as maintaining market share. Grow it, or it will decline." PAGE 36

"We have to invest in culture, not just technology, and we have to do it all over the world." PAGE 48

"We spent $65 million, down the hole. And we've resurrected *Ralph Nader*. It's like Lazarus." PAGE 106

"My view, looking at the numbers, is that a recession has probably begun." PAGE 133

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"Foreign nationals must have as much of a shot at the top as domestic talent." PAGE 157

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EDITOR'S DESK

Cynthia Hutton and Bill Saporito stop to smell the flowers.

THEY ARE NOT ALL household names, and some of them aren't even very big. But they are all giants in their field. These are the companies that through foresight, fortitude, and occasionally a bit of luck have seized huge market shares and defended their positions so well that they are virtually impregnable. How do they do it? Associate editor Bill Saporito's cover story on supercompetitors sets out the rules every manager should know to play the market share game.

Tokyo chief Carla Rapoport

For companies that win, the prize is control over their own destiny and protection from global competition. You can't become a market leader just by cutting prices. As Saporito notes, "You have to meet the specifications of your customers, and specs are getting tighter all the time." Quality, adaptability, and knowing what your customer will need tomorrow are key requirements.

Saporito uses his legs and eyes to find out whether companies can deliver what they promise. "If you've been in enough factories," he says, "you can tell who's efficient just by watching what people are doing." For this story he inspected plants from Racine, Wisconsin, to Harrisburg, Pennsylvania, to Minneapolis.

Reporter Cynthia Hutton polled dozens of Wall Street analysts to compile a list of market share champs of assorted sizes. She and Saporito were most impressed by the variety of paths these enterprises have followed to domination. "Some innovated and got in early," says Saporito. "But nothing recedes like success if you're simply going to say how wonderful you are. A number of supercompetitors—AMP, Emerson, and Kodak among them—had to undergo fundamental changes to maintain their position." For how they did it, see page 36.

Also in this issue is Tokyo bureau chief Carla Rapoport's report on the growing global reach of a whole nation of supercompetitors. Though Japan has long protested that it has no ambitions for international political or financial leadership, Rapoport found that it is increasingly moving toward just that. This is just the latest of many ground-breaking stories by Rapoport. She uncovered Japan's plans to become a force in global oil production, reported on its large and growing defense industry, and regaled us with tales of great Japanese mistakes. International editor Don Holt describes Rapoport as a reporter who "gets her sources to say the darnedest things." That skill shows in her candid portrait of a huge economic power still groping to find its place in the world.

Marshall Loeb
MANAGING EDITOR

INVESTORS LOOK FOR LEGAL AID

■ When a prospectus for a limited partnership offering units in a Washington State orchard crossed broker James Wheeler's desk in 1984, the deal looked so appetizing that he bought $10,000 worth for his own account. Says Wheeler: "The only distribution we received was a little box of apples in 1986." Today Indian Wells Orchards, which got $13 million in investors' money, is in Chapter 11. Wheeler, then with

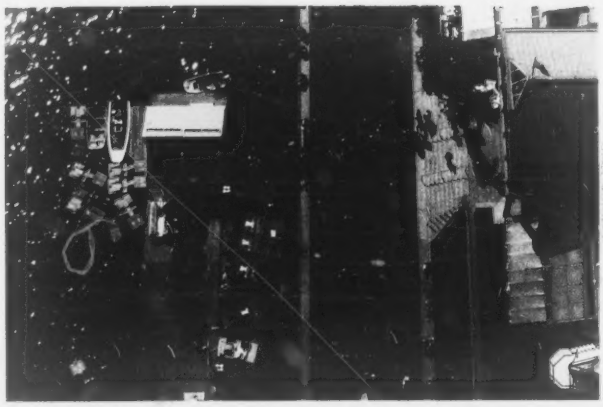
Wheeler and a souvenir

Shearson, which underwrote the deal, will be lucky if he gets anything else back from his investment. The same holds true for clients who followed his lead.

It is no secret that many investors have been battered by limited partnerships that failed to perform. But the sheer volume of failures is only now beginning to show, as more and more of these "investments" turn sour. By now even the most patient investors realize the extent of their losses. Nobody is sure just how many are involved. But Steven Bleier, president of Diversified Financial Management of White Plains, New York, a company that analyzes these investments, estimates that up to 10% of all partnerships offered between 1980 and 1985 are insolvent.

The brokers and syndicators who promoted them are beginning to feel investor wrath via their attorneys. Indian Wells limited partners have brought a class action suit against Shearson, claiming that the brokerage misrepresented the orchard's potential. Shearson also is involved in litigation related to at least one other partnership. Among syndicators, **Southmark** of Dallas and **Jacques-Miller** of Nashville are loaded down with troubled partnerships that could spell legal problems.

– Andrew Evan Serwer



Baltimore's Harborplace: where the waterfront makes money

WATERFRONT BLUES

■ The water's edges at Baltimore's Harborplace and Boston's Faneuil Hall are highly successful marketplaces, a colorful mix of stores, bars, and restaurants that bring in waves of tourists and retail dollars seven days a week. But in most other places, this kind of waterfront development is yet to prove a success—as **Rouse Co.**, the firm founded 50 years ago by real estate innovator James Rouse, has found out. Although the company developed the profitable Baltimore and Boston locales, its South Street Seaport in New York City has not made money since it opened five years ago. Other recent Rouse Co. projects, Miami's Bayside and New Orleans's Riverwalk, lose money.

Thus warned, nephew Willard's independent **Rouse & Associates** has decided to get out of a $40 million plan to turn Penn's Landing in Philadelphia into a marketplace. Similarly, the elder Rouse's new firm, **Enterprise Development**, which has sunk over $30 million into riverfront projects in Flint, Michigan, and Toledo, has upped anchor from those ventures, leaving its partners—the cities—to do with them as they see fit.

What's the lesson for developers? Being on the water is not enough. Unless the area is easily accessible and likely to be visited by sufficient hordes of spenders, the project will fail.

– Reed Abelson

HOW DIRECTORS CAN HELP SHAREHOLDERS

■ Are shareholders represented as well as they could be by a company's directors? No, say a hefty one-third of the 102 outside directors of FORTUNE 500 industrial and service companies interviewed by **Egon Zehnder International**, an executive search firm.

Other responses in the survey suggest that there may be more unrest in boardrooms than management, including inside directors, would like (see table). Says Gregory Carrott, a consultant with the firm: "What seems to be emerging is a new breed of outside director who is more independent and less likely to follow management's lead."

Those words are now echoing at **Oak Industries**, which manufactures electronic equipment. **Roderick M. Hills**, former chairman of the Securities and Exchange Commission and an outside director of Oak, has launched a proxy battle to unseat five of the eight directors, including the chairman, Ed McNeely.

Hills, who has no stock in the company, has one main gripe: Management lacks the

WHAT DIRECTORS SAY IS WRONG WITH CORPORATE BOARDS

Too few directors have international business experience.	64%
Institutional investors have too much power, and something should be done to control it.	50%
Inside directors cannot be expected to have the best interests of shareholders in mind in takeover situations.	40%
Inside directors make a company responsible to itself, not to shareholders.	35%
"Don't rock the boat" is the unspoken credo of most board members, inside and out alike.	28%

SOURCE: EGON ZEHNDER INTERNATIONAL

industrial experience necessary to run the company. Oak piled up $321 million in operating losses between 1982 and 1986, at which point it slowly began to pull into the black. In 1988 it made $13 million pretax on sales of $198 million. Says Hills, a managing partner at **Donovan Leisure**, a law firm, and a new director of **Drexel Burnham Lambert**: "I couldn't be more unhappy doing this. I could have just resigned from the board, but that would have meant walking away from the shareholders. I couldn't do that." **– Susan Caminiti**

The times they are a-changin'.

'GOD OF MANAGEMENT'

■ In a curious mix of capitalism and religion, Konosuke Matsushita fervently believed that the ultimate aim of production was to eliminate poverty and create prosperity. So

Konosuke Matsushita

Matsushita raised production volume and went against conventional Japanese practices by *lowering* prices. **Matsushita Electric Industrial**, a company that began by making electrical sockets, grew to become the world's No. 1 consumer electronics manufacturer, with annual sales of $38.5 billion. When Matsushita died in April at 94, the Japanese press canonized him as the "god of management." Many Westerners agree, perplexed though they might be by company songs, a tradition he introduced to corporate Japan. Behind this immense success was an intensely curious and spiritual man, who also published a monthly magazine *PHP* (Peace and Happiness Through Prosperity). Like most other Matsushita products, the journal became a best-seller.

– Frederick H. Katayama

RUSSIA'S ROLEX?

■ The new status symbol wrapping fashionable wrists this summer could be the Soviet military-style watch above. Already a hit in Italy, the somewhat clunky $100 timepiece comes complete with a red star on the face—and a detachable but loser-proof cap to fit over the knob, keeping it ticking 90 feet under water. The watches are assembled in Hong Kong using Russian-made quartz movements and will be distributed in the U.S. by **Gruen Marketing** of Secaucus, New Jersey. Saks Fifth Avenue, Bloomingdale's, and Marshall Field's are among the tony capitalistic emporiums that will begin selling them next month. Each timepiece will be packaged in a small tin can that also contains a replica of the pin that President Reagan and Mikhail Gorbachev wore on their lapels in Geneva in 1985 at their first summit meeting. **– S.C.**

SHAKEOUT IN SUPERCOMPUTERS

■ Having a big rival drop out of your business sounds like nothing but good news. But **Cray Research** may have lost its worldwide competitive edge now that **Control Data**, the only other U.S. supercomputer maker, has abandoned the business. Japanese salesmen are sure to try to convince prospective customers that Cray will not be around to supply parts and service further down the line. Prospective contenders—including Steve Chen's **IBM**-supported **Supercomputer Systems**—will not have a product until the early 1990s.

Currently Cray has 63% of the $1-billion-a-year world market. Aside from Control Data's 6%, three Japanese makers—**NEC**, **Fujitsu**, and **Hitachi**—split the rest. But Cray has lost its lead in Japan, and Europe may be next.

Cray's big disadvantage is relative puniness: In 1988 revenues from mainframes were over $600 million, and sales dropped 20% in the first quarter of 1989. Its Japanese competitors are diversified giants. Hitachi, a $40 billion conglomerate, makes products ranging from rice cookers to nuclear power plants. Since supercomputers are crucial to national security and technological leadership, Clyde V. Prestowitz Jr., former Commerce Department counselor on Japan, says: "If Cray isn't able to hang in there, the government will do its damnedest to keep it in the game." **– F.H.K.**

Cray's Y-MP supercomputer

NOW HEAR THIS

■ **CHALMERS WYLIE**, 68, ranking Republican on the House Banking Committee, on why he wants to toughen the capital requirements for S&Ls as part of a bill that would overhaul the industry: **"It would be the sin of sins to fund this bill without fixing the problem."**

■ **ELHAM MANSOUR AL-DEKHEIL**, 28, a Saudi Arabian with a doctorate in education from Ohio State, on her career plans in a country that is yielding to women's demands to work: **"I am going after jobs filled by foreign men, like all those manning computers in banks and offices."**

■ **TURNER L. COBDEN**, 59, a former municipal bond underwriter who left Smith Barney a year ago and whose underwriter son was let go by Oppenheimer, on how those in public finance should plan ahead: **"Make it quick and get out."**

BY VIVIAN BROWNSTEIN

BUSINESS EXUBERANCE FADES AS THE ECONOMY SLOWS

OVERVIEW

- **Inflation and interest rates top the executive worry list: a FORTUNE survey.**
- **After-tax income will slow as inflation eats up wage gains.**
- **So consumer spending will grow by only 2%.**

■ If you find it hard to tell good news from bad these days, just remember, disagreement abounds among the experts too. Signs of slowing growth, such as the March decline in manufacturers' sales of durable goods and the slide in housing starts since January, are regarded as a definite plus by some, the only way to keep inflation under control. Some who fret that the long expansion has petered out are cheered by signs of stronger activity—the healthy rise of orders for capital equipment, for example. Still others have resurrected the dread word stagflation, the mixture of slow growth, double-digit inflation, and high unemployment that afflicted the closing years of the 1970s and was cured only by severe back-to-back recessions.

Extreme language is out of place to describe a humdrum outlook. The expansion is still alive; it is just moving more slowly. The Commerce Department's report on first-quarter GNP had something for everyone. Leaving aside a post-drought jump in farmers' output, real GNP advanced at a 3% annual rate, faster than some expected but a bit slower than the 3.6% in the previous period.

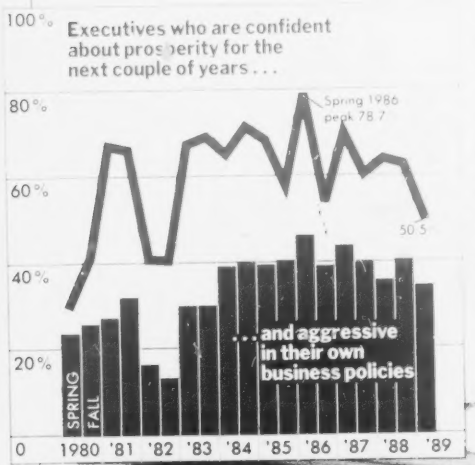
Consumers, who will set the pace in the coming year, have clamped down on outlays, just saying no to enticements from car, clothing, and other merchants since December. For the year, consumers are likely to lift spending by only 2%.

Money hasn't been the problem. Bolstered by high employment and rising wage rates, as well as a bump-up in payments to farmers, real disposable income grew at a 7.5% annual rate during the first quarter after a 3.6% advance last year. But consumers have been saving more lately. They put away a subpar 3.2% of income in 1987, causing lots of hand wringing about profligate Americans. They saved a more respectable 4.2% of income last year.

The big question is how much do consumers want to sock away from now on. If they are heading toward a 6.5% savings rate (the March figure was 6.3%), the norm in earlier decades, the expansion will be in serious trouble. Our own forecast is for savings to average 4.5%, only a bit higher than last year. One reason: Real income won't increase much. Employment will grow more slowly, and inflation is speeding up about as much as wages. So aggregate real after-tax income will advance by only 1.5%.

Executives responding to FORTUNE's surveys of the business mood and of inventory plans reflect the mixed state of the economy—spirits are damped. Confidence in the general outlook is lower than at any time since 1982, and fewer characterize their own policies as aggressive (see chart). Interest rates have replaced the budget as the major concern: 68% expect high interest rates will be an obstacle to continued expansion, vs. 39% who felt that way six months ago.

As a consequence, executives are less satisfied with the Federal Reserve than they have been since last spring. The number who think the Fed should ease up has doubled, though to a still relatively small



KEEPING CLOSE TABS

Despite clouds ahead, business is still investing: Scanners like the one held by this B. Altman employee help lower costs.

PHOTOGRAPH BY KEN KERBS

THE SLIDING INVESTMENT MYTH

Nowadays it is almost a cliché to say the U.S. is devoting much less of its output to plant and equipment, imperiling future economic growth. Well, don't say it, because it just isn't so. The facts are entangled in the esoteric world of national income accounting, but the key question is depreciation. In a paper given before the Carnegie-Rochester Conference on Public Policy in April, Frank de Leeuw, chief statistician of Commerce's Bureau of Economic Analysis, argues convincingly that the number to watch is real *gross* investment—the inflation-adjusted spending for capital goods—rather than commonly used *net* investment—the spending less depreciation.

Subtracting depreciation supposedly corrects for deterioration in the equipment as it wears out or becomes obsolescent. At first glance this seems appropriate and provides the basis for the claims of the doom-and-gloomers. During the 1980s, net investment as a percentage of GNP has stayed well below the postwar average.

De Leeuw contends that taking out depreciation leads the analysis astray. The makeup of capital spending has shifted toward short-lived equipment such as computers and trucks, and as this shift is going on it boosts depreciation for a while, thus lowering net investment. As de Leeuw argues, "While net investment *dips* temporarily, capital services *rise* temporarily—because short-lived investment goods emit services at a faster rate than long-lived goods." A truck with a life of ten years, for example, would provide 10% of the value of its total capital services in a year, but a machine with a 33-year life would provide only 3%. And so de Leeuw concludes that net investment "moves in the wrong direction."

After using some technical improvements in the method of adjusting capital goods spending for inflation, de Leeuw calculates the ratio of gross investment to gross domestic product (output provided by labor and capital). The result shows a pervasive uptrend from 8.2% of GDP in 1960 to 12.1% in 1980—and only a flattening since.

CHARLES ARCHAMBAULT

Frank de Leeuw's healthy investment

How does de Leeuw reconcile this less jaundiced view of investment with the low U.S. savings rate? For one thing, he points out what many people haven't noticed, namely that equipment prices have been falling relative to general prices, giving the savings invested more bang for the buck. The other factor he cites is familiar: the inflow of capital funds from abroad that substitute for the meager U.S. saving. Since this inflow is not sustainable at anything like the recent levels forever, domestic saving will eventually have to expand to replace it.

The de Leeuw numbers don't justify complacency for other reasons either. Productivity has grown more slowly in recent years than it did earlier in the period since World War II. The causes are legion (see The Economy). Perhaps to lift productivity faster we do need more investment, not because capital spending is absorbing a shrunken share of output but because other conditions, such as the makeup of the labor force, have changed. But unraveling the exasperating mystery of retarded productivity is a question for another time. **– Todd May Jr.**

20%. Another 10% continue to think the Fed hasn't gone far enough. The Fed may indeed keep a tight grip until it can sense an easing of inflation—though for now it isn't pushing interest rates any higher. Business will grumble about high rates, but the expansion should survive.

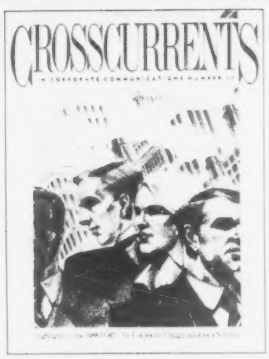
DON'T GET THE IDEA that all the business executives tell a gloomy story. On the contrary, three-fourths report that their own business is currently good or very good, the same proportion as six months and a year ago. Quite a few are worried about continued increases in the cost of doing business. But many more comment that the high level of consumer purchasing power and confidence is the most favorable factor in the outlook, despite the fact that rising wages are part of the cost problem.

They are expecting a repeat of last year's 4.7% increase in prices, most likely a too sanguine view. Measured by the comprehensive GNP price index, inflation jumped to a 5.0% annual rate in the first quarter. Though that included a pay raise for federal employees and the military, it presaged inflation numbers to come. Wages for workers in the private sector are on the rise—FORTUNE expects hourly pay to advance by nearly 6% during the next year, a percentage point faster than during 1988.

Not surprisingly, manufacturers suffered the biggest drop in confidence in the latest survey. Though 1988 turned out to be a good year, especially for the big boys on FORTUNE's list of the 500 largest industrial companies, gains have slowed in the last few months. Manufacturing output advanced by a 4.7% annual rate in the first quarter of 1989, compared with 5.6% in the previous four quarters. And all the rise came in January. So capacity utilization eased a bit in February and March, albeit to a still disturbing level in most industries.

By holding down output now, industrial companies may quash a potential inventory problem. A feature of this expansion, noted in these pages before, has been business's fast reaction to an unplanned stock buildup. The bumpy path of inventory accumulation has played havoc with the GNP growth rate at times, goosing it one quarter and making it look anemic the next. But far better a bumpy road than the roller coaster ride that slack inventory control

AIDS
BLACK MONDAY
CORPORATE IDENTITY
RESTRUCTURING
TAKEOVERS
OUR AGING POPULATION
GLOBAL COMPETITION



These words were heard frequently as top communicators from all over the country gathered at the 1988 FORTUNE Corporate Communications Seminar to discuss "Communication in an Era of Change."

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has given the economy at times in the past.

Retailers, distributors, and manufacturers together would prefer 3% less inventory in relation to their sales than they now find themselves holding. This excess, indicated by the gap between the actual and the desired ratios on the chart, is larger than at almost any time in this expansion.

BUT MANUFACTURERS, who are looking at the biggest overhang, are moving quickly to contain the damage. Judging from their responses to survey questions, the bulge occurred because expected sales failed to materialize. More than half said current inventory is higher than was planned for. That is double the number of companies in that spot any time last year. What happened to just-in-time inventory management? Wasn't it supposed to prevent old-fashioned inventory overhang? Well, yes, but some aspects of inventory have grown more difficult. The irregular flow of imported parts and supplies can make control less than perfect. And finished goods can still back up if retailers or distributors cut back too suddenly—stocks were piling up through January but then started to fall. Once finished goods inventories are restored to better levels, look for output to expand again.

Despite problems, inventory turnover has improved significantly during the 1980s. Now retailers and manufacturers are cooperating to go a step past J-I-T inventory management at factories and take the concept right to the retail floor. They call it Quick Response, a combination of steps taken to lower stocks and replenish them much faster. "Much of the initiative is coming from the largest retailers," says Randy Nord of Kurt Salmon Associates, management consultants.

Alex Dillard, executive vice president of the department store chain founded by his father, William Dillard, explains the incentives: "Inventory control is only part of the benefit; sales and profitability increase because you can virtually eliminate out-of-stock situations. Checkout time is quicker, so sales people can service more customers." According to Mark Frantz, another Kurt Salmon consultant, between 25% and 40% of potential sales are lost because of "stock outs," as they're called. Dillard, J.C. Penney, Wal-Mart, and others of their heft cooperated in a successful pilot project nearly three years ago.

The heart of the system is those bar codes you see at your grocery store; they're starting to appear on everything from dresses to blankets at general merchandise and department stores. The machines that read the bar codes and transmit sales information automatically up the line are spreading rapidly. Frantz says that 200,000 devices are slated to be installed at the top four chain retailers—Sears, Penney's, Wal-Mart, and K mart—more than the 175,000 units now in grocery stores.

The better controls could put inventories on a smoother path, but not for a while. A correction is in order now. FORTUNE expects accumulation to fall from the $43 billion annual rate of the first quarter to an average of $20 billion over the next year, as manufacturers and other businesses adjust to slower growth in sales. The smaller buildup will hold down overall GNP growth this quarter. It could temporarily offset much of the strength expected elsewhere, such as the rise in capital goods and exports, and thus leave the economy on a lackluster course. F

LESS FOR THE SHELVES

Inventory-to-sales ratios look low, but managers report that the first quarter ended with stocks higher than they wanted.

CHIEF ECONOMIST *Todd May Jr.*
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FORTUNE's forecast is produced by this magazine's economists using our own economic model.

COMPANIES THAT COMPETE BEST

These killers will do just about anything for another percentage point of market share. They will innovate, emigrate, and acquire. Hell, they'll even restructure the company. ■ *by Bill Saporito*

CALL THEM market giants, dominant players, or, more viscerally, "killer" competitors: These are companies you don't want to come up against in your worst nightmare. In the businesses they're in, they amass crushing market share. Then they amass some more.

Some bear familiar names: Eastman Kodak, Perrier, Emerson Electric, a powerhouse of the electric motor business. Others you may have heard of only if you've had the bad fortune to try to sell against them: Unifi, the big guy in selling textured polyester yarn; Jostens, the class act in class rings and other school memorabilia: AMP, manufacturer *extraordinaire* of electrical connectors. In their managerial tenets, they all have a lot in common. Their watchwords:

■ Market share matters. The 90th share point isn't as important as the 91st, and nothing is more dangerous than falling to 89. "We don't like to hear 'We have such a large market share' as an excuse for complacency," says Don C. Lein, president of Jostens. "There are companies that are market leaders who grind out a little bit larger share year after year."

■ Understand and remember precisely what business you are in. This is harder than it sounds. What business is Perrier in? Water? Nope. Soft drinks? Wrong again. Try natural beverages, a subtle distinction that means approaching customers quite differently. Would-be rivals, including Anheuser-Busch, Nestlé, and Coca-Cola—no marketing slouches—missed it.

■ Whether it's broke or not, fix it—make it better. Not just products, but the whole company if necessary. Emerson and AMP both have decades of success behind them and long histories of steadily increasing dividends. Laurels to rest on? Hardly. Over the past five years each has put itself through wrenching structural and strategic changes to meet the challenges of the marketplace.

■ Innovate or evaporate. Particularly in technology-driven businesses, nothing quite recedes like success: An upstart's product or marketing improvements can undermine a leading position in months. Kodak recently introduced its best film ever, Ektar, just two years after introducing another world's best, Kodacolor Gold film. Company executives pledge to repeat the process again soon—before Fuji Photo Film does.

■ Acquisition is essential to growth. Forget the not-invented-here syndrome. Emerson evaluates 600 companies a year as possible acquisitions, even though it typically ends up buying fewer than ten. The most successful purchases, the killer competitors say, are in niches that add a technology or a related market.

■ People make a difference. Tired of hearing it? Too bad. Both high-technology outfits such as AMP and low-tech ones such as Perrier and Jostens spend abundant time and money on selecting, training, and motivating workers.

■ There is no substitute for quality and no greater threat than failing to be cost competitive on a global basis. These are complementary concepts, not mutually exclusive ones.

Ringleader: H. William Lurton of Jostens

LONG USED to dominating their markets in the U.S., the killer competitors increasingly appreciate that they must now do the same on a global basis (see The Economy). In his 15 years atop Emerson Electric, Chief Executive Charles "Chuck" Knight, 53, ratcheted the company's motor business—for power tools, appliances, and industrial purposes—from third place in the U.S. to first by 1980. To get there, Knight invested heavily in motor technology and manufacturing and infused his managers with his own impatience. By 1984, though, Knight was watching his market share being nibbled away by Japanese and Taiwanese competitors that underpriced Emerson by 30% in some appliance components.

Knight and his managers reacted with a sweeping realignment that reverberates to this day, creating a world-class competitor in a hurry. "Man, we moved this company," says the effervescent Knight. Literally. Knight moved more than 3,000 jobs offshore, closed 49 of some 250 plants, and vowed that never again would Emerson let itself get pushed into such a vulnerable cost position. "Our response was to get our costs down so that we were better than anyone else in the world," says Knight. "It was not a fun time."

Of such short-term pain is long-term success made. Knight won few fans when he shifted one-third of the 600 jobs at the company's Therm-O-Disc operation, which makes components such as temperature controls, to a Mexican factory to take

REPORTER ASSOCIATE *Cynthia Hutton*

advantage of lower wage rates. Sure, the company could have lowered the price on its domestically manufactured components, protecting share temporarily and keeping the jobs in the U.S. But then, argues Knight, it would have been only a matter of time before all 600 jobs were lost: "The thing that we didn't really understand when we started this process was that by moving the 200 we not only protected the other 400, but the move put us in a position to get more market share." Exporting the jobs lowered average cost, allowing Emerson to cut price. With the resultant additional business and more favorable currency rates, the company has been able to add back the 200 jobs, plus 400 more.

The same attitude that Emerson takes toward competitors—in your face, approximately—also prevails in company councils. "We are very confrontational. The minute you back off, a little of the intensity drops," says Knight, whose own intensity level is about 327 on a scale of 1 to 10. Emerson executives *tread carefully if they want to* add plant capacity. Don't measure the anticipated return based on what the existing plant does, Knight warns them. That's falling for the dreaded low-cost delta syndrome—comparing yourself against yourself, rather than against the world best.

WHEN EXECUTIVES at Emerson's In-Sink-Erator division in Racine, Wisconsin—it makes kitchen disposers—sought to add capacity, Knight wanted to know what the return would be compared with that of a competitor's Taiwanese plant. If the In-Sink-Erator folks couldn't beat the world cost, they would not get funds. They could and did. Says Knight: "There are very few executives wandering around Emerson not knowing what's expected."

In-Sink-Erator may have an in-sipid name, but it demonstrates Emerson's competitive philosophy. Emerson bought the company in the Seventies, when it had a decent 30% market share. Last year In-Sink-Erator commanded more than 70% of the market. With statistical process control, just-in-time inventory, and make-it-right-the-first-time tactics, the Emerson division has lowered its in-plant quality costs by over 25% per unit produced. Service claims have dropped to 0.4 per 1,000 units per month, down from 2 per 1,000.

By making improvements like these, Emerson has turned more than half its products into market leaders; 84% are either first or second. It's a figure the company pays attention to: Emerson has pushed the number up almost a point a year over the past ten years. In 1988 the company increased revenues 8% to $6.65 billion, while profits climbed 13% to $529 million. And with a 10%-a-year average growth in revenues, Emerson has added nearly 6,000 jobs in the U.S.

continued

SHADES OF GENEEN AT EMERSON ELECTRIC

COMPANY	1988 SALES ($ millions)	BUSINESS LINE	MARKET SHARE (est.)	COMMENTS
ALCO STANDARD	$3,809.6	Paper distribution	15% U.S.	Hundreds of competitors; no one else close
AMP	$2,669.7	Elec./electronic connectors	20% worldwide	Quadruple the size of the No. 2
ANHEUSER-BUSCH	$8,924.1	Beer	42% U.S.	This Bud wants half the market
BRUSH WELLMAN	$345.8	Beryllium-engineered products	65% worldwide	Owns *the* beryllium mine in the West
CLOROX	$1,259.9	Bleach	50% U.S.	Now going after P&G's detergents
DELUXE CORP.	$1,196.0	Check printing	50% U.S.	Earnings you can bank on
EASTMAN KODAK	$17,034.0	Consumer film	50% worldwide	A giant reawakened
EMERSON ELECTRIC	$6,651.5	Disposers	72% U.S.	No. 1 in lots else, too
GILLETTE	$3,581.2	Razors and blades	55% worldwide	Products in every market segment
JOSTENS	$595.7	Class rings	40% U.S.	Chief competitors just merged to fight it
LOCTITE	$416.9	Anaerobic adhesives	80% worldwide	Has stuck to its very small niche
McDONALD'S	$5,566.3	Fast food	25% U.S.	Sold 5 billion burgers last year
MEDTRONIC	$653.3	Pacemakers	45% worldwide	Created first workable cardiac pacemaker
PERRIER GROUP OF AMERICA	$560.0*	Water	22% U.S.	Future U.S. water problems a boon
PRODUCTS RESEARCH & CHEMICAL	$100.3	Aircraft sealants	94% U.S.	Many proprietary polymers
RIDDELL	$20.0*	Football helmets	65% U.S.	Expanding into shoulder pads
ROHR INDUSTRIES	$906.8	Commercial nacelles	85% worldwide	Likely to run at 100% capacity for years
UNIFI	$298.0	Texturized polyester yarn	70% U.S.	Proving that polyester isn't dead

SHADES OF GENEEN AT EMERSON ELECTRIC

Emerson Electric's Chuck Knight can't understand it. One of his major customers, an appliance manufacturer, is still buying motors from General Electric, a competitor of Emerson's. GE, Knight hastens to point out, makes not only motors but also appliances: "It's crazy. Why subsidize your competitor?" Knight hopes to demonstrate to this customer that giving Emerson the business will lower his costs and raise GE's cost of doing business. It probably wouldn't hurt Emerson much, either.

Deliciously aggressive, this, and pure Knight: driven, calculating, and willing to body-punch when he gets in close. Knight, a tall, athletic man who plays a mean game of racquetball on the company court, has been pushing Emerson hard since 1973, when he segued into the CEO's job. He was then a management consultant in his father's firm, Lester B. Knight & Associates Inc., helping Emerson, a longtime client, in its search for a new chief. Eventually he decided to throw his own hat in the ring. Emerson chose well. In those days the company was mostly a motor manufacturer, with $940 million in annual sales. On the path to spectacular growth—last year's sales were $6.7 billion— Knight successfully shifted the company's core from electromechanical technology to electronic technology, along the way fending off a three-year lull in U.S. manufacturing from 1984 to 1986.

Emerson's growth is propelled by twin corporate ambitions: to achieve market leadership and to be "best cost" supplier. Knight will not accept being anything less than best cost, meaning lowest cost at a differentiated-quality level. That entails figuring out what the competition's costs are before Emerson builds new plants. Through judicious intelligence-gathering—wrangling a peek at competitors' plants, for example—Emerson has done just this. Says Knight: "We knew what Makita's and Bosch's and Black & Decker's costs were. We never would have built the plants we did without knowing."

To get market leadership, Knight is willing to buy other companies, as he did last year in purchasing Liebert Corp., which gave Emerson worldwide leadership of the power-conditioning market—products that ensure the consistency of the current going into sensitive electronic devices. He has also put pressure on his troops to devise new products, with the goal of getting 20% of sales from products five years old or less. The company is now at 18%.

Knight: driven and deliciously aggressive

Very little at Emerson happens by chance. Although corporate planning is not as chic these days as it was a decade ago, at Emerson it remains in fashion. Knight estimates that he devotes perhaps 60% of his time to reviewing plans submitted to him. The heads of Emerson's 50 or so businesses each spend about three days a year at headquarters in St. Louis presenting plans—very specific ones—to Knight and a team of his top lieutenants.

At Emerson planning is a line job, not a staff function. "The people who develop the plans implement them," says Knight. "That's where we shine." To keep track of the plans, Emerson executives submit monthly operating reports indicating how well they are doing, the criteria being sales growth, profitability, and return on capital. Review of the reports can be quite up close and personal, reminiscent of the grilling Harold Geneen used to give his executives in the halcyon days at ITT. Says Knight: "It isn't meant in a critical or demeaning sense. It's meant in the spirit of 'Boy, you'd better be ready to stand up and defend what you believe in.' "

If things aren't going to plan, says Knight, the problem usually isn't in the plan: "People don't fail in planning; they fail in implementation. Why? Well, my fundamental belief is that they fail because of the lack of ability to get people involved and committed." To make sure he has the right people in charge, Knight spends lots of time in his personnel command post, a room in which the names, photos, current positions, expertise, and experience of his top 700 executives are arrayed on magnetic boards, by division and business. If Knight needs an experienced manufacturing executive for his Xomox valve division, he can likely find him or her right there on the wall.

Knight places a premium on the autonomy of the various subsidiaries—operations with names such as Alco Controls, Appleton Electric, and Micro Motion. "I'll give you a dollar every time you see the Emerson name at one of our companies," says the CEO. (He owes us a buck.) Profit and loss are calculated at the operating unit level. Although Emerson's sales have increased more than sixfold under his tenure, the size of its corporate staff hasn't budged.

Some of that autonomy, however, is being sacrificed to the effort to go global. Emerson has assembled divisions with like technologies into business groups, with an eye toward selling related products from different groups all together to Emerson's biggest customers worldwide. Those division heads need not get a power complex, though. Says Knight: "We will not, in our accounting systems, even add up a group's sales and earnings. It's irrelevant."

Kodak President Kay Whitmore refocused the company to hit back at Fuji Photo Film.

IN THE SUSQUEHANNA Valley of central Pennsylvania, rarely mistaken for Silicon Valley, sits the world's leading manufacturer of electrical and electronic connecting devices—at their simplest, the plugs at the end of computer cables. More complex connectors represent as much as one-third of the cost of some computer subassemblies. Simple or complex, they are made by AMP, a killer competitor worldwide.

Its traditional strength has been in design and production—the ability to manufacture whatever the customers want. "We engineer the hell out of everything," says Harold McInnes, the cheerful mechanical engineer who is AMP's vice chairman. That attitude has made AMP the largest player in a fragmented industry, with about 20% of a market fought over by more than 500 competitors.

AMP's competitive advantage begins long before products hit the market. The company spends an enormous amount of money, 9% of sales, on its research and development and engineering, and funds development work for Digital Equipment, IBM, and other original equipment manufacturers. By getting a seat at the design table, AMP has a hand in engineering the connecting devices that it hopes to supply. Neat trick.

The company also works diligently to have a voice in the development of industry standards. This is particularly critical where technologies are evolving, such as on the interconnect devices used in local area networks of computers and telecommunications. The folks at newly competitive AT&T thought they had a good chance of bending the standards committee their way, but AMP was ready. Its products became the standard connector on major networking systems such as Ethernet and IBM's Token Ring system.

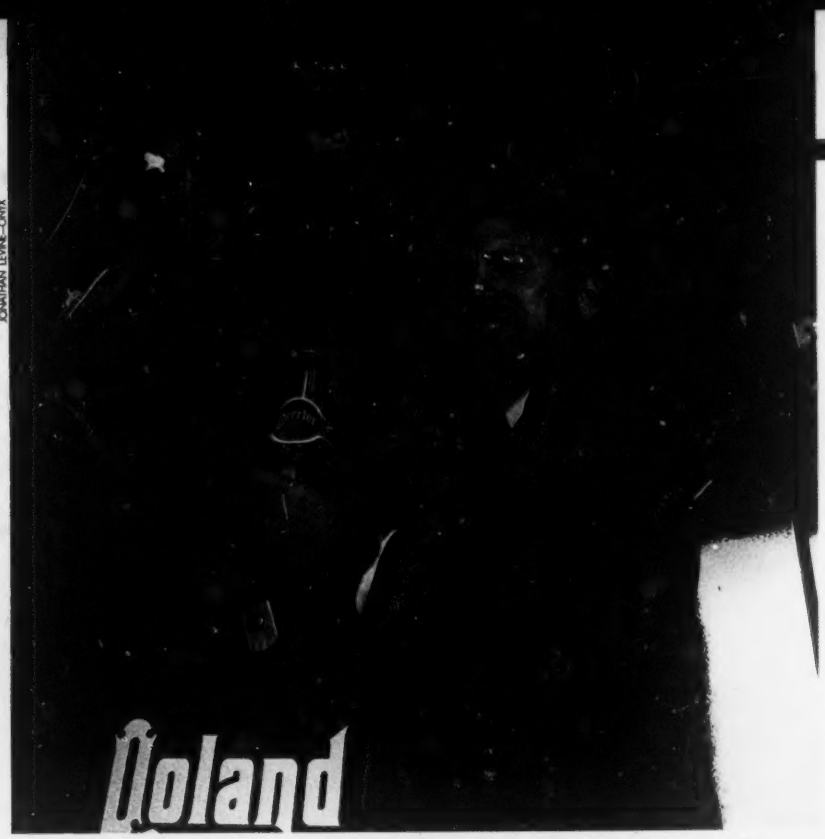
AMP began in the Forties as a manufacturer of electrical terminals and expanded rapidly during the electronics revolution. Now, with the electronics industry growing 10% to 12% a year, down from 15% to 20%, AMP must eat somebody else's market share if the company is to sustain its traditional 15% a year growth. Says Walter Raab, the company's quietly confident chief executive: "When you start talking about growing 15% in a year, to $2.7 billion in revenues, you are talking about adding a company the size of one of our competitors, which we have done."

Up against the likes of Nestlé and Coca-Cola, a smaller company shouldn't be able to gulp share. But Perrier has.

Many of the manufacturers that AMP sells to are bent on eliminating all but a few of their suppliers by raising quality and delivery requirements even as they put the screws on price. In response, AMP is in the second phase of a quality-improvement campaign that began with the goal, set in 1984, of improving quality by a factor of ten in five years. Last year the company turned the heat up again, demanding of itself another tenfold improvement over the three years ending 1990. This is not a campaign consisting of slogans and buttons but a highly technical program measuring some 50 variables across all functions from engineering through secretarial. So far AMP has lowered its "cost of quality," the amount spent getting things right, from slightly more than 16% of sales to about 10%.

UP AGAINST the likes of Nestlé, Coca-Cola, and Anheuser-Busch, it should be all but impossible for a smaller company to gulp market share and profits in the bottled-water business. But Perrier Group of America has done so. Perrier is best known as the importer of fizzy French H_2O, but the company's still-water business runs much deeper: It owns nine brands of bottled water, including Poland Spring, Great Bear, and Ozarka, that have combined U.S. market share of some 20%. No other company is close. Perrier is growing fast too, faster than the bottled-water industry's 15% a year rate, which means it's taking business from others.

Like most successful competitors, Perrier has a basic understanding of all phases of its business—in its case, really two businesses. The first is sparkling water, an alternative to soft drinks or alcohol. The other is a tap-water replacement. Perrier's still-water business has less to do with classic consumer product marketing. Most product is delivered to homes and offices and dispensed through water coolers. That business, says Ronald V. Davis, president of Perrier's U.S. operations, more closely resembles package delivery à la Federal Express than it does pushing soft drinks. The quality of service is just as important as the quality of the water. So Perrier outfits its route drivers in all-American uniforms and trains them as if they were



JONATHAN LEVINE—ONYX

Perrier Group of America President Ron Davis has proved that water isn't a commodity.

going to deliver caviar rather than H_2O.

Profitability hinges on service and the efficient management of the route system. For example, when Perrier first took over Poland Spring, an average truck might drive 50,000 miles a year, each day delivering 40 to 50 bottles—admittedly water-cooler–size bottles. Perrier stepped up sales by advertising and referrals, improving its efficiency in the process. The company can run a truck 10,000 miles a year, delivering 150 to 200 bottles of Poland Spring a day. The profits are in the logistics, so building and holding on to the customer base is vital. Says Davis, diplomatically: "This is a different business than Pepsi and Coke are used to."

Busch took on Perrier's Calistoga and Perrier in California in 1986 but abandoned the business last year. Nestlé tried to market Montclair on the East Coast and Vittell in California but washed out, selling Montclair to Perrier in February. Coke has owned Belmont Springs brand, sold in Massachusetts, since 1969, but Perrier's Poland Spring zoomed past it. Busch's and Nestlé's distribution systems were geared more to supermarkets and other retail outlets. Great for soda and beer, less so for water.

In its other business Perrier is practically a generic term for mineral water, although the company spends less than $5 million a year on advertising. The beverage from France represents 70% of the imported-water category, according to the Beverage Marketing Corp. consulting firm. In the past ten years at least 20 companies have taken a run at the green bottle, sans success. Davis is more concerned with expanding the category. To do that, the company has worked hard at shifting the brand's image from chic to healthy, so as to make the brand more acceptable to the masses. Perrier has also taken on the soda crowd by introducing flavored waters. Sales of products bearing the Perrier label are growing faster than the 4.5% growth rate of soda sales nationally.

"Even with a very high share, there is no such thing as maintaining market share. Grow it, or it will decline."

Jostens also sells products but defines itself as in the "recognition" business: The company is the preeminent purveyor of school rings, caps and gowns, and yearbooks. Somewhere along the way, Jostens management recognized that its biggest competitive asset is people.

The company loves to hire teachers tired of measly pay. It thus has a core of former educators selling to educators. The most critical contact isn't with students or parents but with the school administration. Most school systems allow only one company to sell rings to students. So Jostens's sales pitch to administrators is based on the "no problem" premise: that the company can provide a full line of high-quality rings, yearbooks, graduation announcements, and pictures delivered on time, so the school administrators won't have to deal with any complaints from parents and kids. The company has a manufacturing advantage too: five plants spread regionally across the country, making on-time delivery easier.

But people are the key. Says H. William Lurton, chairman and CEO: "You have to keep people motivated to continue to get share. And we have the best training program in the industry. One of the best in any industry." The company also claims the lowest turnover in the industry, critical to maintaining long-term relationships with schools and teachers.

Jostens's 40% market share in rings has been twice its nearest competitor's. Its return on equity last year was an astounding 50.5%, the 12th highest in the FORTUNE 500. The company earned $89 million on sales of $596 million.

OCCASIONALLY even Jove nods, and it takes the interloping of a lesser being to wake him up. The experience worked wonders for Kodak, which has 80% of the U.S. consumer film market, 50% of the global business. Says Kay Whitmore, Kodak's president: "Even with a very high share, there is no such thing as maintaining market share. There are two alternatives: Grow it, or it will decline." In the film business one point of global market share amounts to $40 million in revenues.

As the inventor of film photography, Kodak enjoyed a head start few companies could match. But all that history meant nothing to Fuji Photo Film. In a celebrated marketing coup, Fuji outbid Kodak to become the official film of the Los Angeles Olympic Games in 1984. The move gained Fuji immediate recognition that the company backed with a full advertising, promotion, and retail campaign.

Kodak got the picture. Since then, Kodak has poured it on, unleashing a series of

JON S. ABBOTT

AMP's Walter Raab likes dominating 500 competitors.

product improvements that culminated most recently in Ektar 25, 125, and 1,000 films. These films, demonstrably the best ever made, should give Kodak at least a year's breathing space over Fuji and its other international rivals, Agfa-Gevaert and Ilford.

To keep the improvements coming, Kodak shifted from functional management to business units in 1985. It has refocused its photographic products division into six distinct units that address separate sectors of the business—professional photographers, for instance, and the motion picture industry. The company has also changed its strategic focus from single-minded concentration on the end consumer to working on other parts of the business as well. For example, Kodak now uses ubiquitous comedian Bill Cosby to advertise to consumers a program called Colorwatch. The hook is that the print quality is guaranteed if consumers patronize photofinishers that use Kodak's chemicals and paper. Colorwatch and the acquisition of other photofinishers have increased Kodak's world market share in chemicals and paper about seven points, to 48%, says B. Alex Henderson, a security analyst at Prudential-Bache.

Kodak used acquisitions in its campaign to head off Fuji. Over the past three years the company has bought a number of independent film processors, such as Fox Photo, American Photo Group, and CX. The company also entered a joint venture with Fuqua Industries, combining Kodak's U.S. photofinishing operations with Fuqua's Colorcraft not so much to ram more chemicals and paper through them but to make sure that the Japanese don't. Says analyst Henderson: "The worst thing that could have happened to Kodak is for Fuji to have made Fuqua an offer they couldn't refuse."

Killer competitors wisely use their preeminent positions to strike deals others can't. Riddell has around 65% of the market for football helmets, a share butted away from some 20 competitors over two decades of head banging. But the company still competes as though it were protecting a one-point lead. This year the company signed an agreement with the National Football League that gives Riddell the exclusive right to feature the co[illegible]any's name prominently on each of its helmets in exchange for discounts on helmets and other gear made by Riddell and its part-owner, MacGregor Sporting Goods. Riddell Chairman Frederic H. Brooks says the advertising value of just one Superbowl of such exposure could be worth as much as $4 million.

Riddell is hoping to capitalize on this brand-name awareness in a couple of other businesses. The company recently bought an outfit that makes shoulder pads. It is also aiming to get in on the lucrative consumer athletic-wear business in what promises to be a true test of its competitive spirit. Brooks seeks only the high-end performance gear, though, where Riddell can protect its heavyweight image. "We don't want people to put on our wear like they do a Nike or Reebok running suit and then go to the supermarket," says Brooks. "We don't want couch potatoes wearing our clothes."

Some of the roughest, toughest competitors have emerged by holding their own in shrinking markets. Unifi, of Greensboro, North Carolina, is one of the last survivors of over 50 competitors that entered the Seventies as makers of texturized polyester. Such manufacturers take the raw yarn, bulk it up, and make it more elastic so it can be woven into fabric.

Two things happened to the business, both bad. First, good taste prevailed and double knits died. Polyester lost its appeal as a fabric, and demand for textured polyester began dropping, from 1.2 billion pounds per year in the mid-Seventies to 650 million pounds by 1985. Second, foreign producers of finished apparel, which didn't always buy from U.S. sources, gained market share. These two negatives were too much for the likes of Hoechst, Celanese, and Rohm & Haas, which decided to take their money elsewhere. "The returns just weren't there, unless you had a real conviction of what the future was going to bring," says Unifi President William Kretzer. That conviction has brought Unifi about 70% of the yarn sales market.

UNIFI HAS INVESTED heavily in the business, adding capacity five times in the past ten years. The company spent big to decrease its costs while increasing product quality. Machines that once spilled out 10,000 pounds of poly per week now do more than 70,000. The company also scoured the marketplace to find nonapparel uses for its out-of-fashion product: Most of its sales now come from business, such as home furnishings—sheets, drapes, and upholstered fabrics, for example.

"You must get out there and say, 'I am trying to gain new customers. I am trying to meet new needs.' "

Perhaps the greatest danger for these competitive winners is that they have won the game, up until now. But most realize the minute they start to ease off is the minute they start to become losers. Says Kodak's Whitmore: "Even with a high market share, you must get out there and say, 'I am trying to gain new customers. I am trying to meet new needs.' You have a more forward-looking, more opportunistic approach. You may end up only protecting your market share, but you will, in fact, protect it." Ray Kroc, the legendary founder of McDonald's, put it another way. If a competitor is drowning, he said, stick a hose in his mouth.

JAPAN'S GROWING GLOBAL REACH

Direct investment, foreign aid, and charitable giving are all up sharply. Will political power follow the money? ■ *by Carla Rapoport*

THE JAPANESE money tree keeps on shaking—and spreading. Take just the last few months. Toyota announces a $1.2 billion auto plant in Britain, its first in Europe. Fujitsu says it will spend $690 million to turn out computer chips in northeast England. Kawasaki Steel buys 40% of a division of Armco, the American steelmaker, for $350 million. Minebea, the ball bearing maker, acquires the biggest hog farm in Canada and negotiates for a stereo speaker plant in Taiwan.

Add to that recent purchases of thousands of acres of grazing land in the U.S. West, an Australian petting zoo featuring koala bears and kangaroos, and six joint ventures in the Soviet Union, from chemicals to clothing. Japanese investors have been among the biggest angels on Broadway this season and have committed more than $400 million to make Hollywood films (producing three box office flops so far).

And that covers just investments. Last year the Japanese government gave away $10 billion, mostly to Third World countries, to become the world's most generous benefactor. American aid totaled $8.5 billion. Toshiba has just started a $23 million charitable foundation. Beginning this year, Matsushita, the giant consumer electronics maker (Panasonic, Quasar, National, Technics brands), will donate 0.1% of the annual sales of its American subsidiary to charities or cultural activities in the U.S. That should amount to about $5.1 million for 1989. Says President Akio Tanii: "We've always been manufacturers. Now we have to be socially minded. We have to invest in culture, not just technology, and we have to do it all over the world."

Wealthy individuals are shoveling it out too. Yasuhiro Goh, a member of the Bridgestone tire family, just gave $1.5 million to the Phillips gallery in Washington, the largest single donation by a Japanese to a U.S. institution. Says Goh: "When I first entered the library at the University of Tokyo, I saw a plaque that said, Gift of the Rockefeller Foundation. It's time to see plaques in the U.S. from the Japanese."

Will money buy friends for Japan? "We shouldn't forget, the rich man will never be loved," says Teruyoshi Yasufuku, deputy president of Sanwa Bank. "Americans spent so much on poor countries and what did they get? Yankee go home."

A more pertinent question is whether political power will follow the money, as it did for Britain in the 19th century and the U.S. after World War II. No one can yet be sure. The British and Americans matched strong cash positions with the kind of military power Japan eschews. And most Westerners think Japan has little inclination to lead the world, that the second-richest country is simply bent on conquering market after market. As R. Taggart Murphy, a Chase Manhattan executive in Tokyo, writes in the *Harvard Business Review*: "Japan commands wealth but lacks a global vision. The U.S. has a mission but can no longer finance it."

Until very recently, leading Japanese would have quietly agreed with Murphy, but the mood is changing. One way to think about Japan is to imagine that Grand Rapids suddenly became the richest city in America owing to its fabulous furniture exports. No one in Grand Rapids would have any big ideas about spending the money because everybody was so busy making furniture. That was the case in Japan. Now the Japanese are willing to admit they're rich, which changes everything.

In true Japanese style, Japan's new global vision is bubbling up from the bureaucracy of the foreign ministry, the *gaimusho*, instead of being handed down from on high. Says director of aid policy Kenzo Oshima: "Our policy is economics, economic development. We were poor. We've done it. We are not a military power, but we have other strengths."

Japan wants to administer a home-grown cure to poorer countries. It will build the basics—roads, bridges, power stations—then create industries that can earn foreign exchange by exporting. That strategy worked for Japan, thanks to the American consumer. This time Japan plans to be the customer.

From dominating markets to giving away money, Matsushita's Tanii is a man of the world.

COUNTING PRIVATE loans and investments in addition to aid, Japan contributes more than $22 billion to developing countries, amounting to 24% of the world total. Unlike the U.S. aid program, Japan's is not designed to support strategic alliances. Says Oshima, with some emotion: "We do not make decisions because America tells us what countries are important. Our interests may coincide with those of the U.S., but it's

REPORTER ASSOCIATES *Sally Solo, Constance Gustke*

ILLUSTRATION BY LAURA SMITH

Tourists from Japan feel at home at the Japanese-owned Lone Pine sanctuary in Australia.

a coincidence. We will not be seen as a U.S. puppet!" Thus, Japan sends more aid to the Philippines, because it is a neighbor, than to Turkey, an important U.S. ally in the Middle East.

Under prodding by the *gaimusho* and other ministries, Japan's top business leaders have set up a quasi-private agency called Japan International Development Organization to invest in export industries in developing countries. Half the exports would go to Japan. Over the next five years, the group plans to set up consortiums of manufacturers, trading companies, and banks—mainly though not exclusively Japanese—to sponsor projects worldwide worth more than $1 billion.

WESTERN CRITICS see more than altruism in much of Japan's foreign aid. Officials respond that only some 29% of aid is so-called tied aid, linked to the purchase of equipment or services from a particular Japanese supplier. But the critics claim that the percentage is much higher

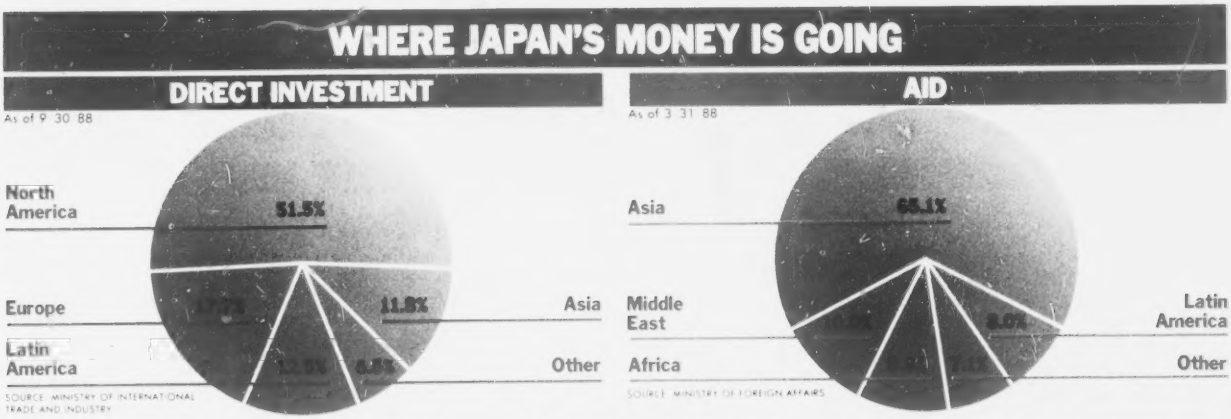
Maurice Strong, chairman of the World Economic Forum, a Geneva-based organization for European managers, says Japan's foreign aid looks like "aggressive assertion of economic self-interest."

Japan makes its biggest impact on the world, and creates the most friction, through overseas investment. It still parks most of an estimated $62 billion in spare cash—the winnings of a huge trade surplus—in U.S. government bonds. This money helps float the U.S. budget deficit, but some Japanese are now suggesting it should be put to better use. Says Akira Nambara, a director of research at the Bank of Japan: "If we just finance America's social entitlement programs, there's no way out of this trade imbalance problem. We should finance U.S. industry, which can improve American competitiveness."

DIRECT INVESTMENT is bound to increase. Nomura Research Institute predicts that worldwide Japanese manufacturing investment could reach $150 billion by 1995. According to the Japan Society in New York, the number of Americans working for Japanese manufacturing companies will almost double by then, to 400,000. Only 3.9% of Japanese manufacturing is now done overseas, but the amount should increase to almost 7% by 1995. The comparable figures at the moment are 18% for the U.S. and 17% for West Germany. Toyota makes only 12% of its cars overseas, compared with 30.5% for General Motors. The number of truly international Japanese companies is still very limited.

If you're a U.S. governor struggling to balance a state budget, it's good politics to make a well-publicized trip to Japan seeking investment. Forty states have permanent offices there, and many foreign governments actively encourage Japanese investment. The backlash sets in as soon as the Japanese unpack their money. When Japanese investors bought three of the best golf courses on the Gold Coast in Queensland, Australia, and tripled greens fees, angry locals forced the community to build a new one. Australian officials, however, refuse to rant against the Japanese. Says Greg Dodds, a marketing official in his country's embassy in Tokyo: "The fact is, Australia is quite dependent on the inflow of capital investment, and the Japanese are the most interested. There really isn't such a thing as a benign overseas investor."

Like unpopular paranoiacs, local indus-



Japanese cash has mainly gone in two directions: investment to the U.S. and aid to Asia. Europe should gradually get more investment yen.

tries often have plenty to fear. For years, Japanese automakers' U.S. market share was held down by voluntary restraints on imports. After the Japanese opened American plants, their share rose by more than four percentage points over three years, mostly at the expense of GM. From 1985 to 1988, GM's share dropped from 43% to 36%. Nissan's market share rose to 4.8% in 1989, after dipping below 4% the previous year, and the company plans to double production capacity by mid-1992. The Japanese are scaring auto-parts makers too. Lee Kadrich, an executive of the Automotive Parts & Accessories Association, says 300 Japanese parts makers will have set up shop in the U.S. by the end of this year, with another 100 expected by 1990. He calls it a "situation of great danger" for the Americans.

Japanese investors brought you Whoopi Goldberg and Sam Elliott in *Fatal Beauty*.

To allay such fears, many Japanese companies form joint ventures or promise to use local suppliers. Mazda plans to produce cars in Europe at a Ford plant to avoid charges of creating excess European capacity. Toyota says 80% of the parts that go into its British-built cars will be made in Britain. Mizuno, which aims to go from zero to 10% of the U.S. sports equipment market by 1995, plans no exports from Japan, only local production or exports from developing countries. Partners are especially useful in the close-knit business of ranching. When Japanese businessman Masaaki Tanabe wanted a U.S. cattle spread, he prudently formed a partnership with a California rancher.

Japanese managers have had more than a little trouble fitting into America's litigious equal opportunity culture. Honda, Sumitomo Corp., Sanyo, and Matsushita's Quasar have all been hit with age, sex, or racial discrimination complaints in recent years. Honda settled out of court, and Sanyo's case was reversed on appeal. Suits against Nikko Securities and C. Itoh, a large trading company, are still pending. Says Lewis Steel, a New York lawyer who has pursued three major sex discrimination suits against Japanese companies: "The men who run these subsidiaries bring their biases with them from Japan. They treat women like office flowers."

Two University of Michigan professors who examined how Japanese companies went about finding plant sites—including Honda in Marysville, Ohio, Toyota in Georgetown, Kentucky, and Nissan in Smyrna, Tennessee—discovered a common thread. The rural counties where all three built new plants have few black residents. The professors point out that the Japanese have thus altered hiring patterns in an industry with traditionally high black employment.

Suspicion of Japanese attitudes toward blacks stems in part from a 1986 statement by then Prime Minister Yasuhiro Nakasone to the effect that blacks and Hispanics lowered the level of intelligence in the U.S. He later retracted it and apologized, but the damage was done. Clarence Thomas, a lawyer who is chairman of the U.S. Equal Employment Opportunity Commission, says the agency keeps an especially close eye on Japanese companies in the U.S.

AFTER ITS SETTLEMENT with the EEOC, Honda commissioned its own report on racial problems in the U.S. The report notes that unlike U.S. companies, Japanese automakers have not adopted minority dealership programs. It also observes that Japan's huge trade position with South Africa could rebound badly against Japan in the U.S. "Should black leaders attack Japanese companies," says the Honda report, "they have little or no risk of doing any lasting damage to their own standing in the U.S. Japan-bashing has no loser." Tetsuo Chino, Honda's vice president for North America, promises his own version of affirmative action. He says that if the company has two equal job applicants, black and white, Honda will hire the black "every time." His goal, he says, is to have a greater representation of women and blacks than do American auto companies.

Black or white, few Americans have made it into high management ranks of Japanese subsidiaries. The Japanese say they are trying to correct that. In March, Matsushita named Richard Kraft as head of U.S. operations, the first non-Japanese to hold that job. Kraft came to Matsushita

Land in California: The Shasta Springs cattle ranch north of Sacramento is a joint venture.

from Motorola in 1974 when the Japanese company acquired Motorola's television manufacturing division. Toshiba, which has 4,000 employees and annual sales of $2.6 billion in the U.S., has no Americans in the subsidiary's top echelon. President Joichi Aoi says that while he hasn't set a deadline, he aims to change that. An American manager wouldn't have to speak Japanese, he declares, "but he must understand our business ways and what headquarters in Japan wants."

Honda's Chino thinks an American may someday sit on the company's board in Japan. Nissan will shortly move the headquarters of its European division from Tokyo to Amsterdam and expects eventually to staff it with European managers.

In a startling break with the past, the Japanese are also forming alliances with Western companies. They are slowly unwinding the old *zaibatsu*, or industrial groupings in Japan, that have been impervious to foreigners for so long. Munemichi Inoue, an economics professor and head of Marubeni Corp.'s economic research unit, says that if a large Japanese company can get a better price from a foreign supplier than from a *zaibatsu* member, it is more likely than ever before to shop abroad.

Have the Japanese really learned the meaning of altruism? Yes, in a Japanese way. Thoughtful Japanese business executives provide two answers. First, a more developed world means a bigger world market, not just for Japanese products but also for the products of Japan's nervous competitors. Says Nambara of the Bank of Japan: "Some country has to take over the role that the U.S. played after the war. It will take time for the U.S. to eliminate its deficit. In the meantime, we can take over that role, the role of enlarging and stimulating the world economy." A prominent auto executive points out that a 10% increase in the global car and truck market means five million more vehicles. The extra capacity Japan is building in the U.S. and Europe would not meet that demand, so other auto companies would get a lot of new business.

Second, Japan needs a lot of internal change. Japanese consumers pay some of the highest prices in the world for everyday items, due in part to an archaic distribution system loaded with middlemen. Japan's financial system is still heavily regulated, stultifying competition, while Japan's rice farmers remain among the most protected in the world. Prominent Japanese now agree that reform must come. Says Yasufuku at Sanwa Bank: "The greatest change ahead is reform of our distribution system. Japanese consumers have figured it out. They go overseas and they realize we are out of line. Before, they didn't know that Canon cameras were cheaper in New York." Already, less expensive goods from South Korea and Taiwan are among Japan's fastest-growing imports.

Training in the Philippines: A Japanese instructor (right) explains workings of an engine.

MANY OF THESE changes can be achieved by the friendly alliance between government and business. The leadership, though, will have to come from business. Most senior members of the ruling Liberal Democratic Party have been crippled by the Recruit bribery scandal, which brought down Prime Minister Noboru Takeshita. Many executives welcome the chance to play a larger leadership role. Says Yoshikazu Kawana, Nissan Motor's director of European sales: "We are a rich country, but we don't have political leaders who can be major players in the world."

The Recruit shambles could enable the Japanese to rid their political system of special interest groups and domestic influence peddling. Maybe even an international statesman or two will emerge. Not long ago, Japanese business leaders were fond of quoting the old saw that Japan would catch cold whenever the U.S. sneezed. No one says that anymore. Now the issue in Japan is how to say *Gesundheit* to the U.S. gracefully and get on with the business of leading. ■

HOW SAFE ARE YOU IN THE AIR?

Terrorists and an aging fleet of aircraft threaten the industry's impressive safety record. Maintaining safety in the air and security on the ground will get costly. ■ *by Anthony Ramirez*

BREATHLESS and sweating from lugging your garment bag, you have just made it onto a packed plane. You settle into your seat. A man squeezes by, carrying a radio-cassette player. Wait a minute. Isn't that the way terrorists blew up Pan Am flight 103 over Scotland? You look up at the ceiling—which reminds you of that Aloha Airlines flight, where part of the aging jet's fuselage tore away like a convertible top and sucked a hapless flight attendant from the plane. Are those cracks you see? How *old* is this plane? You watch the ground crew closing the cargo bay door. Didn't that hatch shear off the other day on a United 747, abruptly pitching nine passengers *and their seats* into the Pacific Ocean? The door on your jet closes with a thud. Suddenly the last place you want to be is on a plane.

And thereby hangs our tale, or at least a major portion of it. For while air travel is as safe as ever, *perceptions* of danger have increased, and perceptions of fiery or watery death have a horrible reality of their own. Those perceptions will worsen. By some projections, the number of passengers who board planes worldwide will double to more than two billion by 2000. On the odds, as traffic surges so will the number of accidents reported in living color on your TV news.

Reality could get worse too. In one important aspect of safety, the upkeep of aircraft, the next few years will be especially critical. The world fleet averages 11.7 years old, the U.S. fleet 12.7, and the most elderly commercial aircraft are over 24. Airlines ordering planes today won't get them from sold-out manufacturers until the mid-1990s. Carriers in need of "lift," as it is called in the trade, rarely junk old aircraft; only 54 commercial jets were scrapped last year out of a worldwide population of some 7,900. The crunch is particularly severe in the U.S., where the fleet age has increased 50% since 1980. Leasing companies and used-aircraft brokers are thriving, multiplying the number of owners that a single jet will see in its lifetime and increasing the chance of maintenance screw ups—George was supposed to have done it.

continued

ROBERT NICHOLS—BACOL STAR

The pilot of this 19-year-old Aloha jet turned around and saw only "blue sky." A flight attendant died and 65 passengers were injured.

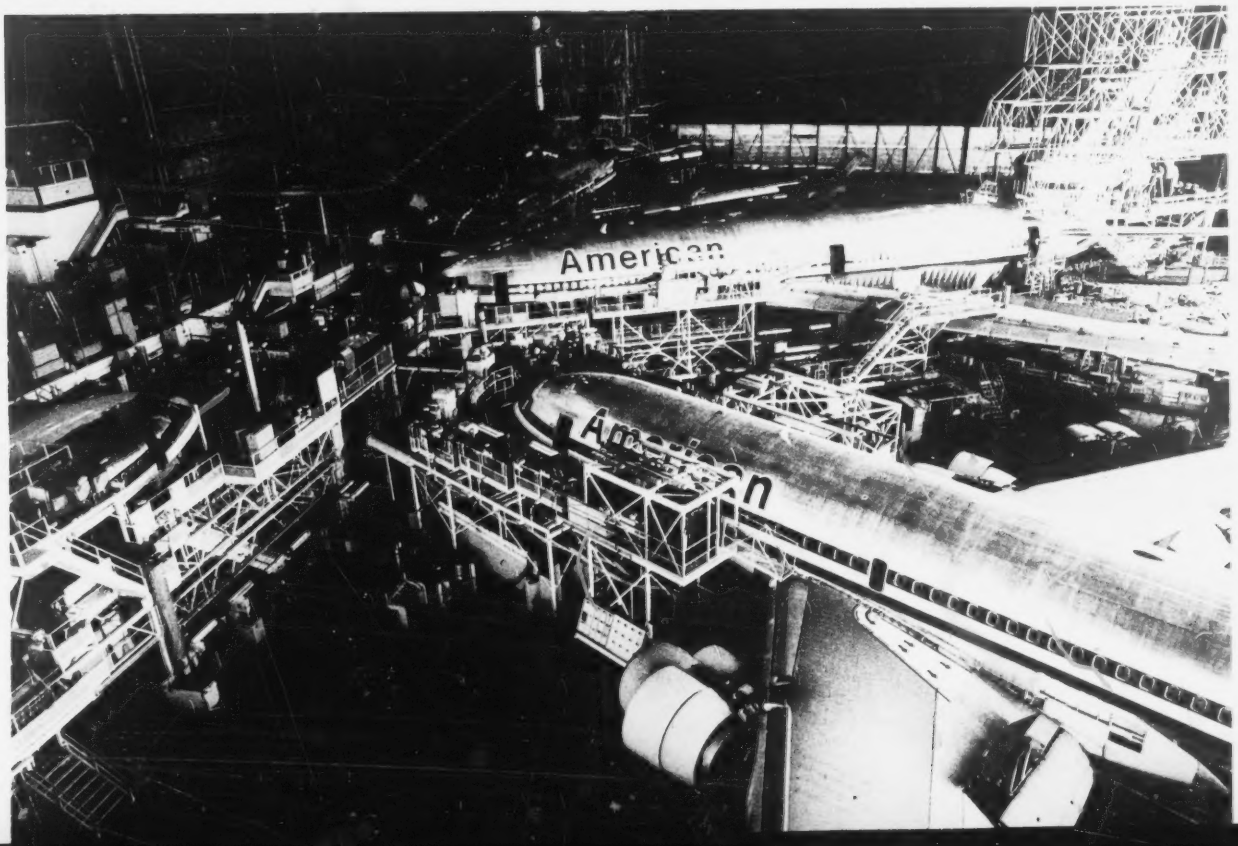
Under the cost pressures of deregulation, the U.S. industry as a whole has scaled back maintenance spending as a proportion of overall outlays. About 11.2% of operating expenses went to upkeep in 1987, compared with 13.2% in 1977, even though older planes cost more to maintain. There are two ways of looking at those numbers. The carriers attribute the savings to greater efficiency, notably including givebacks by the mechanics' union; the union says the carriers have been nickel-and-diming maintenance budgets. Patrick Murphy, chief operating officer of Avitas Inc., a Reston, Virginia, firm that does maintenance audits for 80 airlines worldwide, thinks more spending is needed: "All the money that U.S. carriers cut from maintenance is going to come back and bite them."

FOR THE RECORD, plane travel is reassuringly safe. Last year—even with 709 passenger deaths worldwide, 259 of them on Pan Am 103—the chance of being killed was barely one in 500,000 departures. Indeed, for the past 20 years the odds have blipped randomly between one in 500,000 and one in 250,000. Measured in deaths per million passenger-miles, cars are 30 times more lethal.

Above, a mechanic inspects a Boeing 767 engine at American Airlines' Tulsa maintenance facility, the company's largest. Below, aircraft undergo the thorough inspection known as a "C" check.

This is not to say that air travel could not be safer yet. Many steps to reduce accidents caused by weather or human error, such as modernizing airports and updating computers, are proceeding at a lamentably slow pace because Congress and the Administration have frozen spending from the $6 billion Aviation Trust Fund, the proceeds of a ticket tax imposed to pay for safety improvements. Not spending the fund makes the federal deficit look smaller.

STILL, progress is being made. Take the deadly weather pattern known as wind shear, which pilots fear more than any other atmospheric hazard. Wind shear is an invisible, violent downdraft that can reach speeds of 80 miles an hour and dash a plane to the ground during takeoff or landing. By 1993 the FAA will require all U.S. commercial jetliners to carry wind-shear detection equipment that costs as much as $50,000 per plane. Honeywell, Sundstrand, and Safe Flight Instrument Corp. of White Plains, New York, make the devices now or plan to soon. They don't warn of wind shear until the plane is already in it, but even a few seconds give a skillful pilot a chance. Honeywell's machine recommends specific evasive action. Later



in the 1990s large ground-based Doppler radars will warn of advancing wind shear, but only at the largest airports; a test is under way at Denver's Stapleton. Better airborne detectors that use lasers and infrared sensors are being developed.

HONEYWELL CLAIMS more progress against midair collisions. The FAA is requiring airlines to install traffic-alert and collision-avoidance systems by 1991. The machines, which cost as much as $100,000, are basically airborne beacons that detect similarly equipped planes. When two or more planes near each other, alarms sound, giving pilots 30 seconds to maneuver. If the other plane doesn't have a receiver, of course, it won't get a warning. And pilots complain that the system goes wild in "Indian country"—clouds of small private planes, like the popular Piper Cherokee, that crowd the skies around major airports.

The best airborne warning system is still a pilot looking out the window, but many of them have less flight time than in the past. Fewer are coming from the military services, the traditional source, because the services are training fewer pilots and trying harder to keep the ones they have. Consequently the percentage of hires with less than 2,000 hours of flight time rose to 14% last year from 2% in 1983. Experience pays: The 59-year-old pilot of the United 747 that lost a cargo door stabilized the crippled plane with unorthodox maneuvers; the ones in the flight manual would have caused a crash. Claude Pepper, hear this: The hero was a month from the FAA's mandatory retirement age.

Air controllers looking at their radar screens are the major ground-based collision system, and they too are lagging in experience. The controller force never recovered fully from the devastating 1981 Patco strike; it may have been a bit fat and obstreperous, but it now limps along with 10,000 senior controllers, 1,000 fewer than before President Reagan sacked the strikers.

But the accident that seized the world's attention was the one that dramatized the growing problem of aging planes. Says John Goglia, a lead mechanic for USAir and an official of his mechanics' union local: "Aloha wasn't a slap in the face for the industry, it was a punch in the stomach." While the National Transportation Safety Board has disclosed preliminary assessments of the Aloha accident, it hasn't announced the official cause. Investigators immediately focused on the plane's age—19 years. Every subsequent incident has triggered ritual questions about aging aircraft. Initial news reports of the United cargo-door accident last February made a point of the plane's age, also 19 years, but investigators now suspect a faulty door latch. The FAA had ordered airlines to inspect the latches and reinforce them. United did so but skipped a mandatory reinspection because of a clerical error.

In the Aloha case as well, the critical factors may have been maintenance and inspection. Inspection ranges from quick, daily "walk-arounds" to "A" checks lasting several hours all the way up to "D." That one can take several weeks and usually requires stripping much of the cabin interior down to the fuselage skin. The Aloha plane was a Boeing 737, the world bestseller and the workhorse of the jet age. Its skin is a strong aluminum sheet only one thirty-second of an inch thick. Inspectors need to scrutinize less than 5% of its 6,500-square-foot surface—essentially at lap joints, where thousands of rivets join two layers of aluminum to one of the ribs that form the plane's skeleton.

MAINTENANCE and inspection focus mainly on moving parts—the hydraulic cables that help maneuver the plane, the landing gear, and, above all, the more than 30,000 whirling, vibrating components of each engine. The plane itself is a moving part, resembling a continually inflating and deflating balloon when it is pressurized so passengers can breathe normally at cruising altitudes. The more flights, and thus the more pressurization cycles, the more often the fuselage stretches, widening the microscopic cracks that occur when aluminum is bent to cover the plane. Because skies are crowded, planes fly at ever higher altitudes, requiring greater pressurization.

The Aloha plane was not just old but also overworked. Used on Aloha's short, puddle-jumping routes connecting the Hawaiian islands, it had made 89,680 flights, a figure nearly 20% more than Boeing's "design objective" of 75,000. Design objectives are milestones measured in years, flights, and hours aloft—beyond which airlines may find maintenance so expensive that they should consider replacing the plane. Boeing says these objectives have nothing to do with safety but acknowledges that a survey of its aircraft found "some fatigue" in planes that had exceeded the recommended number of flights.

Aloha's aircraft operate in salty, corrosive tropical conditions. Corrosion and metal fatigue can make deadly partners, especially in the thin skin of an airplane. Serious metal fatigue is relatively rare, but worsens with the number of flights. Corro-

REPORTER ASSOCIATE *Charles A. Riley II*

THE FIVE FACTORS THAT MAKE FOR AIRLINE ACCIDENTS

On the whole, planes don't kill people, people do. Most collisions, crashes, and other mishaps result from human error—or perversity. Weather and structural failure cause only 15%.

CAUSE OF ACCIDENT	FREQUENCY % of fatal accidents	RECENT EXAMPLE
Human error Pilots, air controllers, other flight crew members	67%	Collision of Pan Am and KLM 747s at Tenerife, Canary Islands, March 27, 1977; 582 killed
Weather Thunder and lightning, ice, fog, wind shear	12%	Crash of Delta Air Lines L-1011 from wind shear at Dallas–Fort Worth, August 2, 1985; 133 killed
Sabotage and military action	11%	Bombing of Pan Am 747 over Scotland, December 21, 1988; 270 killed, including 11 on the ground
Maintenance	7%	Crash of Japan Air Lines 747 on Mount Ogura, August 12, 1985; 520 killed
Structural failure	3%	Damage to Aloha Airlines 737 over Pacific, April 28, 1988; 1 killed

SOURCE: INTERCONTINENTAL AVIATION SAFETY CONSULTANTS

sion can spread quickly with neglect and accounts for about 80% of maintenance problems. Boeing built the Aloha jet and 290 others using a process called cold bonding, which was later dropped because the joints were found susceptible to corrosion. For many years Boeing had advised all of its customers, including Aloha, on ways to counteract the problem.

Aloha's maintenance crews worked hard. Traffic was booming, and the company had only ten planes, so if one was down for heavy maintenance and inspection, 10% of its capacity was out of service. Unlike the rest of the industry, which usually has about 27 maintenance people per plane, Aloha had only 17. The FAA allows carriers to tailor their maintenance and inspection programs to their own needs, but John Galipault, president of the Aviation Safety Institute, a private industry research group, says standards are too lax. The agency allowed Aloha to conduct the rigorous "D" check in 52 small segments over a period as long as eight years; that inspection is normally performed in four segments over four years. An Aloha plane could thus lose little time in the air, but the company had no clear idea of its overall condition.

WHILE HE DENIES that Aloha skimped on maintenance, Thomas Derieg, the carrier's senior vice president for operations, acknowledges that "what happened in Hawaii was a microcosm of what happened on the mainland" following deregulation. In this case a newcomer, Mid Pacific Airlines, challenged the established carriers, Aloha and Hawaiian Airlines. "We were caught short for a little bit," Derieg says, "so we had to reduce costs and realign our operations."

Aloha's fleet age averaged about 15 years at the time of the accident, and it is not an isolated case. The average fleet age of the nine major U.S. carriers ranges from 8.5 years for Delta to 14.5 for Northwest. Says Ben Cosgrove, a Boeing vice president who heads the company's aging-fleet evaluation program: "With a fleet this large and this old, we're entering an era that nobody's entered before."

Because Boeing, McDonnell Douglas, and Airbus are booked with orders until the mid-1990s, airlines have turned to lessors and used-plane brokers. Ireland's Guinness Peat Aviation, the world's largest lessor, recently placed the biggest order in aviation history—$17 billion for 308 planes from all three major manufacturers. GPA has turned leasing into a blue-chip business, but the used-aircraft market is a dangerous place. "We buy and sell a lot of damaged planes," says S. Ross Lipscomb, president of Aircraft Sales Co., a dealer in Springfield, Virginia. "We turned one over that had bellied in down in Mexico. We jacked her up and sold it to Northeast Airlines, and they sold it to a European airline, and it's still in passenger service." He won't name the current owner.

All these trends argue for strict maintenance standards. A Boeing task force recently recommended an $800 million modification or replacement program for more than 1,300 early models of its 727, 737, and 747 jets. At a cost per plane of about $600,000, the program consolidates work covered by 150 repair bulletins on such things as lap joints, where pieces of aluminum skin could attract moisture and corrode. Like the approach routinely used for engine parts, the program also calls for many repairs or replacements to be made at milestones in the aircraft's life, such as the design objective for the number of flights.

The FAA is stepping up its scrutiny of operators, but the agency's own problems —a shortage of experienced inspectors, as

THE HARD ROAD TO AIRPORT SECURITY

Don't look for real improvements in airport security overnight. The FAA has issued tough new regulations that restrict access to aircraft and maintenance areas and tighten procedures for screening passengers and baggage. Sounds good, but the access rules won't take full effect until 1992. High-tech help for detecting explosives is on the way too—but the machines are expensive, and plenty of kinks remain to be worked out.

The leading piece of technology is a baggage-inspection system called Thermal Neutron Activation, which uses low-level radiation to spot explosives. It had an impressive 95% success rate in recent trials at Los Angeles and San Francisco airports. But TNA is expensive (about $1 million per machine) and slow (six seconds per bag). The first unit is scheduled to go to work at New York City's JFK in June, but by next year only six major U.S. airports will have it.

You can't screen passengers with TNA, so the FAA is sponsoring research on a new generation of so-called vapor sniffers. Sensitive to nitrogen and oxygen, key ingredients of most explosives, they can be deployed at the gate, on board, and even at the air-conditioning exhaust vent just before takeoff. Unfortunately, sniffers too are far from general use.

In the meantime, inspectors will rely on matching bags with passengers, along with improved X-ray units that are twice as costly as existing $35,000 machines. The kind of interrogation and manual baggage search that the Israelis use to good effect is fine if you have only El Al's 21 planes to worry about. But it's uneconomic for large U.S. carriers.

A sniffer whiffs a bag for explosives.

Airline and airport officials sometimes seem more worked up about the FAA than about the PLO. They are furious because no federal funds have been earmarked to help them build the required new gates and perimeters. To arrive at its cost estimate of $170 million for the nation's 270 major airports, the FAA figured that the average number of access points to be secured would be 128. Officials at Chicago's O'Hare stopped counting at 1,627 and never even made it to the cargo area. No wonder industry experts say the price will be more like $1.7 billion. **– Charles A. Riley II**

well as outdated rules—hamper its effectiveness, at least for now. "We're just like cops," says Ray Ramakis, manager of the FAA's aircraft maintenance division. "We can't be there 24 hours a day. We have to depend on people to obey the law." The agency has about 1,000 inspectors; another 500 are to be hired by October 1990. That would merely restore the manning levels of 1983, when domestic air traffic was 40% lower. Airline mechanics deride the FAA's propensity to check maintenance paperwork rather than airplanes. In the Aloha case, the FAA never physically inspected the aircraft itself.

CONGRESS may pressure the FAA and the industry to do more. Senator Wendell Ford, the Kentucky Democrat who heads the aviation subcommittee, is considering legislation to require stricter maintenance and inspections. He is impressed by the way the military handles upkeep of aging aircraft, as well as its practice of simply retiring a plane at a certain age.

Both military and civilian inspectors have turned increasingly to high-tech solutions. So-called nondestructive testing, or NDT, finds hard-to-see flaws, some as tiny as a few millimeters. NDT uses powerful X-rays, but the shadows a crack casts in an X-ray image are often difficult to interpret. An eddy current test passes a magnetic field over the jet's skin; an alarm sounds or a light flashes when a surface crack interrupts the current flow. Similarly, ultrasound uses disruptions in high-frequency signals to find deeply embedded cracks.

All these methods, however, depend on an easily bored human being. To combat wandering attention, the U.S. Air Force uses automated NDT on some of its high-performance aircraft. At a base near Sacramento, California, the Air Force Logistics Command deploys a giant automated neutron radiography machine to hunt down corrosion on F-111 fighter-bombers. By bombarding the 73-foot-long aircraft with neutron radiation, the machine can detect traces of water as small as *molecules* that could corrode metal. The N-ray machine does in 16 hours what human inspectors would need a month to do. The Air Force device, however, costs $14 million. Civilian airline operators snort that the military couldn't compete in a deregulated environment. Nevertheless, the industry may have to learn to adapt the technology, and large-scale production is sure to reduce costs.

Are there fresh ways to approach the human side of inspection and maintenance? Maybe. Japan Air Lines suffered the worst air accident in history in 1985, when a Boeing 747 slammed into a mountain and killed 520 people. Seven years earlier Boeing engineers had improperly repaired the pressure bulkhead at the rear of the passenger cabin. JAL inspectors failed to find the defect—a missing line of rivets—in five heavy inspections.

Before the 1985 crash, JAL's maintenance teams looked after jets the way American mechanics do, seeing dozens of planes in the course of a year. Since then the company has assigned its work teams to specific aircraft. Today a typical 15-man team of mechanics and engineers at Haneda airport near Tokyo oversees a 747 and a DC-10. The team members sign their names on a special plaque inside the passenger cabin. After a major repair, the team leader is expected to fly on the plane.

By bombarding the aircraft with neutron radiation, the machine can detect traces of water as small as *molecules* that could corrode metal.

Satoru Totoki, JAL managing director and senior vice president, compares the system to using a family doctor instead of a clinic. He points out that in English the teams are called "dedicated maintenance crews," in the sense of being assigned to specific planes. But in Japanese, they are called *kizuki*, or "plane crazy." One August day in 1986, a JAL plane was laid over in Thailand with engine trouble. JAL's Bangkok maintenance staff took care of the problem without informing the team leader in Tokyo about "his" plane. The leader, on vacation that day, somehow found out and got the next flight to Bangkok to verify that the repair had been done properly.

The *kizuki* approach is expensive. Government-owned for many years and only recently privatized, JAL has just 96 planes and lavishes 51 maintenance people—including specialists in hydraulics and electronics—on each one. That's almost double the number for a typical U.S. carrier.

Other airlines are trying to turn the aging plane problem to their marketing advantage. American, which has one of the youngest fleets (average age: 9.4 years), boasts that it will get even younger as big aircraft purchases are delivered over the next four years. United just placed a $16 billion order with Boeing. Even Aloha, having sold its two oldest planes for junk, trumpets that three recent acquisitions have rejuvenated its average fleet age to ten years. Safety, however, takes more than replacing aircraft. A brand-new jet, poorly maintained, can crash tomorrow. Think about that too the next time you settle in your seat and the plane door thumps shut behind you. F

Japan Air Lines crews watch over specific planes. These team members salute "their" 747.

ROBERT WALLIS—SABA

BY LESTER B. KORN

HOW THE NEXT CEO WILL BE DIFFERENT

Here's what today's top executives in 20 countries say tomorrow's leaders will be like. A headhunter tells how to develop them.

■ The bulk of major American corporations are failing in one of the most basic tasks—developing tomorrow's CEOs. They can't afford simply to clone today's leaders. They need radically different ones, and that requires radically new approaches to finding and developing them. At stake is nothing less than whether the most successful multinational companies will be based in America or whether foreign organizations, with stronger leaders, will be the powerhouses of the future.

CEOs themselves strongly support this view. To get a broad perspective on the changing requirements for successful business leadership in the next century, our executive search firm initiated a multilingual survey of 1,500 senior executives, 870 of them CEOs, in 20 countries. The study, covering Japan, Western Europe, Latin America, and the U.S., was conducted over the past year by the Columbia University graduate school of business. In an exhaustive eight-page questionnaire, those surveyed were asked to assess the dominant characteristics that describe today's CEO and that will describe the ideal CEO of the year 2000. They agreed that:

■ Visionary leadership rather than managerial skills will be the most valued standard for tomorrow's top officer. Fully 98% of those responding to the survey ranked vision as a top characteristic of the future CEO, against only 75% who describe themselves or their current CEO as having that as a distinguishing trait. Rated considerably less important were such traditional management qualities as making the major decisions personally and stressing loyalty and length of service in rewarding employees.

■ A "Copernican revolution" must take place in the attitudes of American CEOs as the international economy no longer revolves around the U.S., and the world market is shared by many strong players. One disquieting finding of the study: While U.S. executives have identified this change, they still place far less importance on having an international outlook than do the foreign executives surveyed. (See table, next page.)

JOHN S. ABBOTT

Lester B. Korn, 53, is chairman of Korn/Ferry International, Los Angeles, and the author of *The Success Profile*, published this year.

■ The need to communicate frequently with employees will rise dramatically. Only 59% cited this as an important characteristic of top management in 1988, but 89% believe it will be in the year 2000. One force for change: With more lines of business dispersed over wider geographic areas, the heads of multinational corporations will have to spend more time in consensus building to meet management objectives.

Other aspects of human resources management will also gain in importance. Just 58% consider management training and development "very important" for the CEO to promote; 85% say it will be by the turn of the century. Similarly, planning management succession is emphasized by only 56% today, while 85% say it must have high priority in the future.

LEE IACOCCA last year summed up the changes he sees coming in the auto business (FORTUNE, August 29): "If a guy wants to be a chief executive 25 or 50 years from now, he will have to be well rounded. There will be no more of 'Is he a good lawyer, is he a good marketing guy, is he a good finance guy?' His education and his experience will make him a total entrepreneur in a world that has really turned into one huge market . . . He'd better speak Japanese or German, he'd better understand the history

WHAT TRAITS CEOs HAVE—AND WILL NEED

Percent describing traits or talents dominant now in the CEO and important for the CEO of 2000

PERSONAL BEHAVIOR	NOW	YEAR 2000
Conveys strong sense of vision	75%	98%
Links compensation to performance	66%	91%
Communicates frequently with employees	59%	89%
Emphasizes ethics	74%	85%
Plans for management succession	56%	85%
Communicates frequently with customers	41%	78%
Reassigns or terminates unsatisfactory employees	34%	71%
Rewards loyalty	48%	44%
Makes all major decisions	39%	21%
Behaves conservatively	32%	13%

KNOWLEDGE AND SKILLS	NOW	YEAR 2000
Strategy formulation	68%	78%
Human resource management	41%	53%
International economics and politics	10%	19%
Science and technology	11%	15%
Computer literacy	3%	7%
Marketing and sales	50%	48%
Negotiation	34%	24%
Accounting and finance	33%	24%
Handling media and public speaking	16%	13%
Production	21%	9%

Increasing in importance Decreasing in importance

of both of those countries and how they got where they are, and he'd better know their economics pretty cold."

Tomorrow's leader, in his late 30s or early 40s, very likely is today at the company he or she will direct. He has already taken on risky high-profile assignments where one person can make a difference and earn rewards early in his career. More likely than not, he has worked overseas and been given profit responsibility. He understands the needs and markets of developing nations, has a broad view of world politics, may be fluent in at least one other language, and can bridge cultural gaps. In short, this executive is an entrepreneur in a corporate environment.

The responsibility for identifying, preparing, and retaining these individuals rests with their employers and, in particular, with today's CEOs. Here's what current top management must do:

■ **Broaden the field.** Just as a mining company prospects for gold or bauxite to the far reaches of the globe, major corporations must scour the world—not just their home country—for talent. Foreign nationals must have as much of a shot at the top as domestic talent. Corporations must look deeper into the organization for prospects.

Women and minorities will play a much greater role in senior management both because they deserve to and because if they don't, companies won't have enough talent to go around. Other Korn/Ferry surveys suggest that in the case of women, the movement from middle to upper management remains constrained by more than a shortage of talent. Traditional male resistance toward women as bosses still exists. That and any other form of discrimination must change quickly.

■ **Give people priority.** The human resource function can't continue to be relegated to the position of management stepchild, rising to the attention of the board of directors and the CEO only when a major vacancy occurs. Management development planning must be elevated to a priority at least equal to that of the corporate acquisitions team and other profit-generating operations.

Career paths may look like a game of Chinese checkers, managers zigzagging rapidly, always to more responsible positions.

Companies should inaugurate a high-level human resource program that melds with their strategic long-range plan. Reporting directly to the CEO, leaders of the program would develop a systematic process for identifying, training, and motivating peak performers.

■ **Get them ready.** These talented managers form a substratum to mine for future corporate leadership. They should be given tough assignments involving profit responsibility and be rotated to posts with additional responsibility as rapidly as appropriate. When they stumble, they should be evaluated in a way that shows them how to succeed, rather than be shoved off the list of hot prospects. They should be moved strategically within the organization to provide breadth of experience and a well-rounded perspective. An international assignment is important, as is a leave to serve a short stint in government. The political role of the CEO in the next decade will be substantial: He must deal with multinational joint ventures and face the broad social and economic implications of his own decisions.

Companies should establish rotating seats for younger managers on long-range planning committees. Such a step offers the twin advantages of infusing fresh blood into the planning process and giving this talent a larger window on the corporate world. It will help prospective leaders to acquire a strong sense of vision and a perspective on the corporation's evolution.

Also essential is specialized training in communications, team building, languages, technology, networking, cultural awareness—in addition to management techniques. While traditional skills will continue to be important, 21st-century managers cannot simply be masters of the balance sheet.

Astute direction of management training and development takes on added significance as the corporate ladder splinters and traditional routes to the top disappear. Economic forces have compelled changes in the modern corporate structure, which is no longer a pyramid, but a flatter, leaner, more geographically dispersed entity. Senior management can't afford to routinely promote "safe" executives on the traditional step-by-step path. Career paths may look like a game of Chinese checkers, managers zigzagging rapidly, always to more responsible positions.

■ **Keep them aboard.** A golden handcuffs program for these managers will be vital if corporations want to protect their investment. Otherwise, as competition among companies intensifies, executives will be picked off more often. Current CEOs must rekindle some of the emotional ties that used to hold the best people before the wave of takeovers and restructurings made it evident that middle managers are expendable, regardless of performance. Doing this requires top officers to demonstrate clearly that they care about individuals and their career paths. No compensation package should be structured as an automatic security blanket, but long-term incentive plans must be designed so that it is costly for the individual to leave and give up future rewards.

A rigorous evaluation should be held annually, tracking this pool of promising executives closely. The program must accommodate change and the constant influx of new members.

CONTRASTING VIEWS

Percent of U.S. and foreign executives describing an attribute as "very important for the CEO of tomorrow"

VALUED MANAGEMENT PRACTICES	U.S.	FOREIGN
Emphasizes international outlook	62%	82%
Experienced outside home country	35%	70%
Trained in foreign language	19%	64%
Personally makes all major decisions	17%	26%
Emphasizes ethics	93%	77%

■ **Expand the role of the board.** Companies should bring promising managers before the directors—possibly assigning them as staff to board committees—rather than limit the board's contact to a few familiar faces. Directors must become more aware of their responsibility to provide oversight in the management development process as part of helping their companies adjust to changing world conditions. That means assuming an activist stance rather than just reacting to management initiatives. At the very least, board members can provide an objective perspective in a process often bogged down in politics and outdated loyalties. An old-fashioned, slow-moving executive development program is still in place in far too many corporations.

CEOs typically prefer not to face the issue of replacing themselves, pointing as it does to their own mortality. But management succession—identifying the top candidates and arranging for a smooth transition—must be part of any human resource effort aimed at shaping new generations of leadership. A board committee established to confront the problems of succession can provide a long-range perspective in human resource development. The succession plan should include the top ten to 15 positions in the company.

Outside directors can see much more clearly than CEOs their responsibilities in this area. A recent study conducted by Korn/Ferry reveals a vast difference between the views of outside and inside directors: 81% of the outsiders surveyed ranked management succession as their No. 1 priority, while only 36% of the board chairmen—most of whom are insiders—put it among their top *three* issues.

CORPORATIONS will need to tap an enormous wealth of talent to compete successfully in international arenas. Yet many companies have failed to face the fact that the pool of managers truly capable of running global businesses is relatively small. This scarcity is made acute by the demographic shifts of a maturing population. The shrinking number of future managers will greatly affect salaries, workplace organization, and the development of human resources. Relying on the cream to rise automatically to the top, as we have in the past, is too great a gamble. F

TUSCALOOSA

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Even during startup, workers at JVC's U.S. plant in Tuscaloosa were breaking records.

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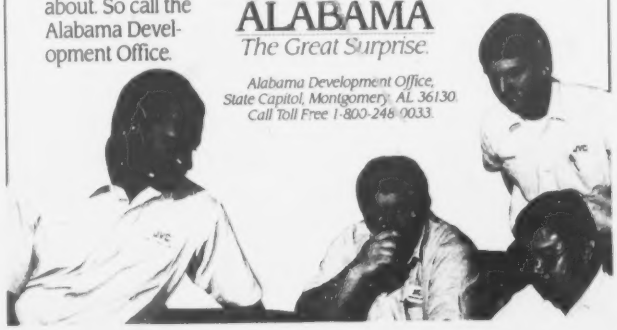

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YUPPIES ASHORE!

I was delighted to read in "Yuppie Spending Gets Serious" (March 27) that the yuppies are giving up on sailing. Thank God! Last summer they jammed every street, cruising anchorage, racecourse, and stool in worthwhile sailors' watering holes from Marblehead to Newport to Annapolis. This winter they so crowded the schedule of charter yacht brokers in the Caribbean that a proper yachtsman could hardly find a free boat. Worse, they've copied our clothes and drunk our choice to the point that you can't tell them from us.

DONALD A. MACAULAY
Marblehead, Massachusetts

FAST CAR, BACKWARD HORSE

In "Luxury Cars: New Leaders in an Upscale Upheaval" (April 10) the caption should read: "Below, the famous Ferrari prancing horse—backwards."

I fear someone in your art department flipped the negative on this photograph. The Ferrari trademark is always prancing to the left.

JAMES A. KENTON
Missouri City, Texas

He's right, and the Ferrari in "A Portfolio of Blue-Chip Cars" is a GTB, not a GTS.

BE THANKFUL THE PHONE RINGS

Concerning Other Voices (April 24), John Graham may have a point. However, I believe that he probably wouldn't return a call from his wife.

Graham should be thankful that he has been successful enough to receive such calls from brokerage trainees. Where was he when he got started 35 years ago?

By making cold calls, some of us provide for our families so that they may grow up to make the "Elite Called List."

PHILLIP J. BOOTH
Account Executive, PML Securities
Louisville, Kentucky

CORRECTION

In the FORTUNE *500 (April 24): Interco's (No. 133) total return to investors for 1988 should be 149.2%, rank 4; 1978-88 should be 21.5%, rank 97. USG's (No. 152) total return to investors for 1988 should be 31.3%, rank 110; 1978-88 should be 25.1%, rank 67. Gillette's (No. 128) annual growth for earnings per share 1978-88 should be 12.1%. The Savannah Foods & Industries (No. 347) earnings-per-share change from 1987 should be 41.5%; 1978-88 growth rate should be 15.7%, rank 66. Hudson Foods, Rogers, Arkansas, was omitted and should have ranked No. 473 in sales.*

Address letters to FORTUNE, Time & Life Building, Rockefeller Center, New York, N.Y. 10020. Letters may be edited for purposes of clarity or space.

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